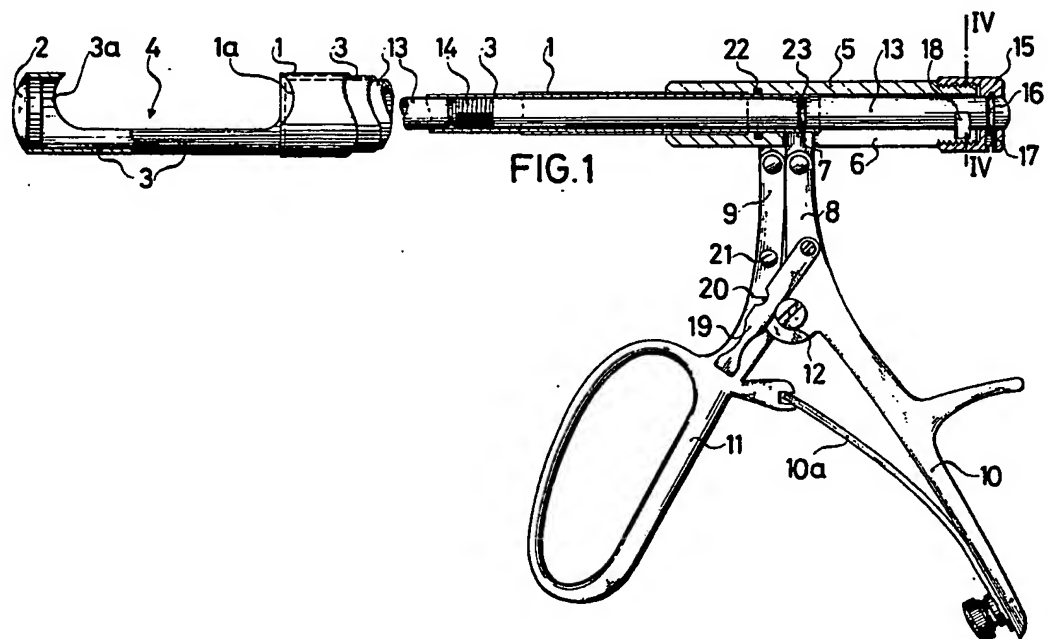
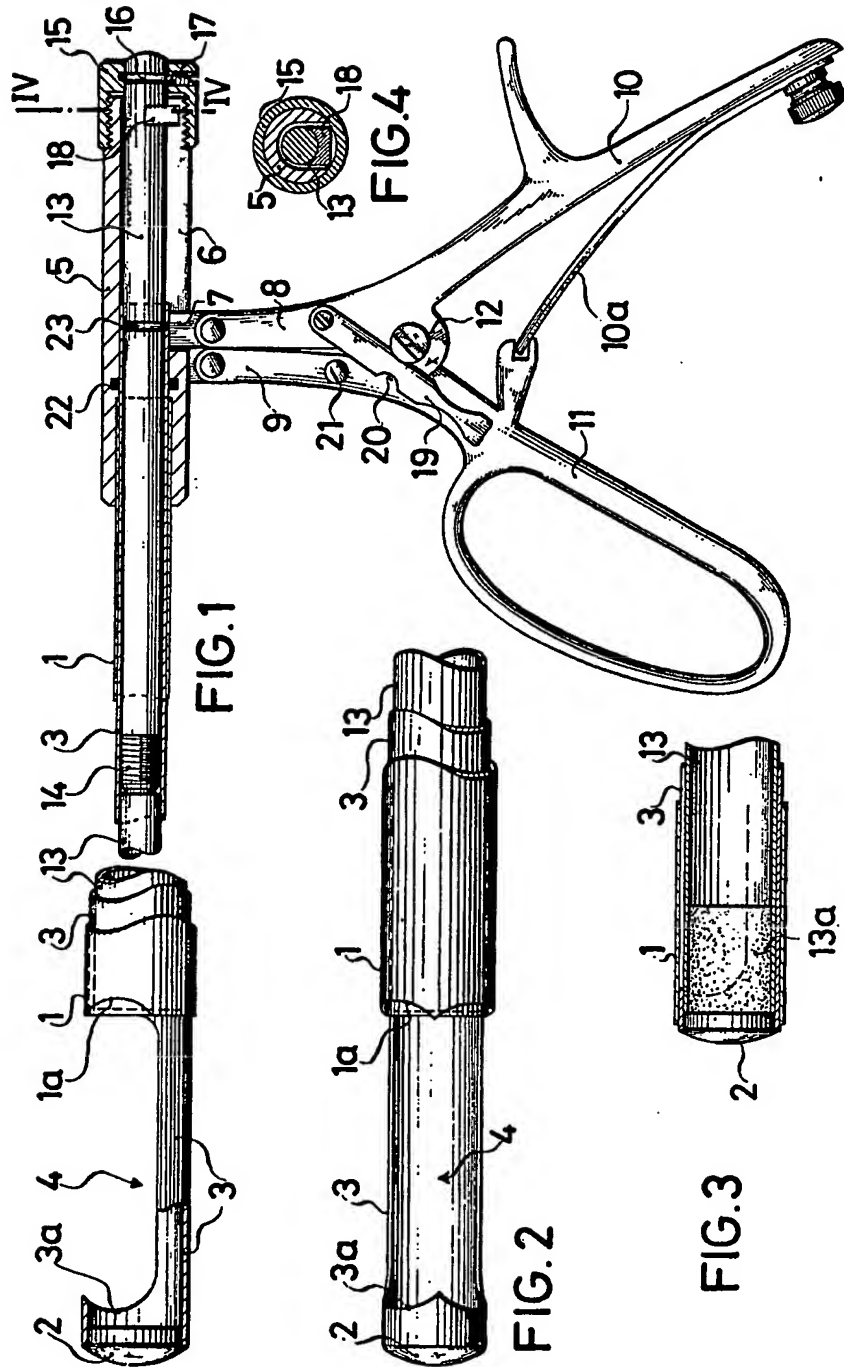


and closing off said shaft distally over at least a larger distal length, said punch assembly also being axially movable with respect to said shaft.





SPECIFICATION

Improvements in or relating to devices for obtaining tissue samples

5 The present invention relates to devices having tong-like handles, for obtaining samples of tissue from the body, of the kind incorporating a punch assembly provided with a distal recess and a cutter. Such devices are used, for example in performing biopsies.

10 With known devices, often referred to as tissue punches of the above mentioned type, as exemplified by German GebrauchsmusterNo 705342 it is necessary, every time the distal groove is filled with tissue, to remove the punch assembly together with the shaft from the field of operations through a trocar tube for example so as to remove the tissue and, then return the tissue punch to the operational area again.

15 It is an object of the invention to be able to remove the tissue after each or several perforation steps and to leave the shaft and the punch assembly in the operational area.

20 This and other objects are achieved by providing a device for obtaining tissue sample of the kind having tong-like handle members and in which a punch assembly provided with a distal recess and a cutting edge is axially extensible from a shaft and insertable in a tube provided with a counter cutting edge, which device consists in that said punch assembly comprises a continuous distally closed tube which is axially movable in relation to a tubular receiver member for collecting punched-out tissue that is carried by said tube and loosely connected proximally to said shaft and closing off said shaft distally over at least a larger distal length, said punch assembly also being axially movable with respect to said shaft.

25 With this construction, only the receiver member which catches the tissue which has been stamped out needs to be withdrawn in the proximal direction by disconnecting a proximal connection with the shaft so as to remove the tissue from the receiver member; this receiver member is then reinserted through the tubular punch assembly which has remained in the operational area with the shaft and is again connected up to the shaft for punching out more tissue.

30 In order that the invention may be more clearly understood, reference will now be made to the accompanying drawings which show one embodiment thereof by way of example and in which:—

35 *Figure 1* is a side view of the device in its operational position with the proximal portion in axial section and the distal end shown in side view to an enlarged scale and in part axial section,

40 *Figure 2* is a plan view of the distal end of the device to an even larger scale than that of

Fig. 1.

Figure 3 is an axial section of the distal end of the device with the punch assembly retracted, and

70 *Figure 4* is a cross-section along the line IV-IV of *Fig. 1*.

Referring now to the drawings, the device for obtaining samples of body tissue consists of an outer shaft 1 provided with a prong-shaped cutting edge 1a at its distal end in which a tubular punch assembly 3, which is closed at its distal end with a stopper 2 and providing a distal recess 4 having a prong-shaped counter cutting edge 3a, is axially displaceable. The shaft 1 is fixed proximally in a reinforcing housing 5 which has a longitudinal slot 6 in the side opposite the recess 4, through which projects a rectangular connecting piece 7 which is connected with the punch assembly 3. The shanks 8 and 9 which are pivotally connected to two handles 10 and 11 at 12 in the manner of tongs, pivotally connect the connecting piece 7 and the outer shaft 1. The tong-like handles are forced by a spring 10a into an open position in which the connecting piece 7 of the shank 8 reaches the distal end of the slot 6 and in which position the punch assembly 3 with the recess 4 protrudes out of the shaft 1. Conversely, on closing the handles 10, 11 the punch assembly retracts into the shaft 1 due to the spreading of the tong shanks 8 and 9 until the distal end of the punch assembly 3 closes off the distal end of the shaft 1.

100 A receiver member 13 which is proximally detachably connected to the reinforcing housing 5, passes through the tubular punch assembly 3, and is formed by a tube which is distally open over at least a large distal length and closes off the distal end of the shaft 1 and is used for collecting the punched out tissue as will be hereinafter explained.

The remaining quite short length of the distal tubular end of the receiver member 13 is formed as a solid rod which is screwed into the tubular part at 14 and is detachably connected to the housing 5 by a cap nut 15. In order that the screw 15 can be screwed on to the housing 5 without turning the receiver member 13, the nut 15 and the receiver member 13 are each provided with an annular groove 16 in which a number of ball bearings have been inserted through a radial bore sealable by means of a grub screw 17 so that the nut 15 is rotatably connected to the receiver member 13 by a ball bearing and can be screwed onto the housing 5. The receiver member 13 is prevented from rotating by a wedge 18 which engages in the longitudinal slot 6 of the housing 5. However, if desired, the screw 14 and the nut 15 may have threads of opposite hand so that the nut 15 can be fixidly connected to the receiver member 13.

130 The medical tissue sample-obtaining device

operates as follows. By pressing together the tong-like handles 10, 11 the shanks 8, 9 open, the punch assembly 3, 4 passes into the distal end of the shaft 1, as shown in Fig. 3, and in this position the handles 10, 11 are locked by a latch 19 which moves horizontally so that a recess 20 therein engages with a pin 21. The device is then inserted into a body cavity through a trocar housing for example. As the body cavity must be kept distended by a pneumoperitoneum in certain circumstances, the punch assembly 3 is kept sealed against the housing 5 by a ring 22 and the receiver member 13 is kept sealed against the punch assembly by a ring 23 and the punch assembly 3 is closed at its distal end by the stopper 2.

After insertion into the body cavity the whole latch assembly 19, 20, 21 is released so that the shanks 8, 9 approach the handles 10, 11 due to the spring 10a and thus the punch assembly 3 is pushed out of the shaft 1 into the position shown in Fig. 1. The recess 4 is now pressed against the tissue to be punched and the handles 10, 11 are pressed together so that a portion of tissue is punched out by the insertion of the punch assembly 3 into the shaft. Thus the tissue portion which is punched out is pressed into the distal tubular part of the receiver member 13 where it is additionally held by an inner rough part 13a during removal of the punch assembly for a further punching operation. During successive punching operations, the tissue portions or samples are collected in the distal receiver member 13.

Finally the punch assembly 3 is pushed into the distal end of the shaft 1 again and secured by the latch assembly 19, 20, 21 and then the nut 15 is unscrewed from the housing 5 and the receiver member 13 is removed whilst the shaft and the punch assembly remain in the body cavity so as to remove the tissue collected from the receiver member 13, the screw coupling 14 of the receiver member 13 advantageously being undone. Then the receiver member 13 is again inserted and fastened in position by the nut 15 so that further punching operations can be carried out.

CLAIMS

1. A device for obtaining tissue samples of the kind having tong-like handle members and in which a punch assembly provided with a distal recess and a cutting edge is axially extensible from a shaft and insertable in a tube provided with a counter cutting edge, wherein said punch assembly comprises a continuous distally closed tube which is axially movable in relation to a tubular receiver member for collecting punched-out tissue that is carried by said tube and loosely connected proximally to said shaft and closing off said shaft distally over at least a larger distal

length, said punch assembly also being axially movable with respect to said shaft.

2. A device as claimed in claim 1, wherein the shaft is attached proximally at the distal end of a reinforcing housing the proximal end of which latter is detachably attached to the proximal end of the receiver member, said housing having a longitudinal slot for the passage of one of two shanks pivotally attached to the punch assembly, the other one of the two shanks being pivotally connected to the housing.

3. A device as claimed in claim 2, wherein the receiver member which is axially fixed with reference to the shaft, is connectable to the housing proximally by means of a nut which is rotatable on its proximal end and is screwable onto the proximal end of the housing.

4. A device as claimed in claim 2, wherein the receiver member engages proximally in the longitudinal slot of the reinforcing housing by means of a wedge to prevent its rotation.

5. A device as claimed in claim 2, wherein the distal tubular receiver member has a threaded distal rod portion the proximal end of which is connected with an oppositely-threaded nut which is screwable onto the proximal end of the reinforcing housing.

6. A device as claimed in claim 3, 4 or 5, wherein the nut and the receiver member are provided with opposed annular grooves in which several ball bearings are located.

7. A device as claimed in any of claims 2 to 6, wherein the tubular punch assembly is sealed on the outside with respect to the reinforcing housing and on the inside with respect to the receiver member by means of sealing rings.

8. A device as claimed in any of the preceding claims, wherein the interior of the distal end of the tubular receiver member is provided with roughening means.

9. A device as claimed in any of the preceding claims, wherein the cutting edge and the counter cutting edge of the punch assembly and the shaft are in the form of prongs.

10. A device as claimed in any of the preceding claims, wherein the position of the closed tong-like handles members with the shanks open, is fixable by a latch member cooperable with a pin against the action of a spring.

11. A device for obtaining tissues samples, substantially as hereinbefore described with reference to the accompanying drawings.

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